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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 22

Application Number: 08/900,254
Filing Date: 08/900,254
Appellant(s): Pfeuffer

Mr. Michael Stimson
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 04-05-00.

(1) ***Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

(2) ***Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Applicant explicitly indicated that there are no related appeals or interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 2 and 3 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

4,496,583	Yamamoto et al	01-29-85
5,232,595	Meyer	08-03-93
4,876,007	Naruo et al	10-24-89
2,862,542	Norton	12-02-58

Yamamoto et al, drawn to forming a filter sheet with excellent material strength, discloses forming the sheet from a blend of undrawn polyester fibers and drawn polyester fibers. (col. 2 line 64 to col. 3 line 21; col. 9 line 59 to col. 11 line 47). In addition, Yamamoto et al also discloses that the undrawn fibers can be fuse-bonded at a low temperature and teaches pressing the sheet using heated calender rolls (col. 3 lines 11-21; col. 5 lines 1-4; and col. 8 paragraph 5).

Meyer or Naruo et al, drawn to forming filters, discloses the advantages of using pleated filters over unpleated filters.

Norton, drawn to making a corrugated filter, discloses using a pair of profiled calender rolls to form a corrugated filter from a fibrous sheet (figures 1-2).

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al (US 4,496,583) in view of either (Meyer (US 5,232,595) or Narou et al (US 4,876,007)) and Norton (US 2,862,542).

Yamamoto et al discloses a method of forming a paper-like polyester sheet having an enhanced filtering property and excellent material strength, the method comprises blending undrawn polyester fibers with drawn polyester fibers; and forming the paper-like sheet from the blend (col. 2 line 64 to col. 3 line 21; col. 9 line 59 to col. 11 line 47). In addition, Yamamoto et al also discloses that the undrawn fibers can be fuse-bonded at a low temperature and teaches pressing the sheet using a heated calender rolls (col. 3 lines 11-21; col. 5 lines 1-4; and col. 8 paragraph 5).

Yamamoto et al is silent on forming "spacers" (i.e. pleats) on the paper-like sheet. In other words, Yamamoto is silent on making a pleated filter paper sheet. In addition,Yamamoto et al does not also teach calendering the paper-like sheet using profiled calender rolls to form the pleated filter sheet. However, it would have been obvious in the art of making a filter media to form spacers on the paper-like sheet of Yamamoto (i.e. to form a pleater filter paper sheet) because it is notoriously well known in the filter art to form a pleated filter sheet; and because Meyer discloses that *"It is already known that pleated filter papers and ... are also used mainly as air filters in the most varied forms. The advantage of large filter surfaces within the smallest of spaces, as well as low flow speeds as a result of the large filter surfaces are obvious"* (col. 1 lines 35-40) or Naruo et al disclose that *"The pleat-type filter cartridge has an advantage in that*

the area of the filtration membrane within a unit volume (effective filtration area) can be increased to thereby attain an enormous filtration flow rate per unit time. Therefore, the pleat-type filter cartridge is useful for large-scale filtration in the filed ... " (col. 1 lines 23-39). Furthermore, it would have been obvious in the art to calender the paper-like sheet using profiled calender rolls to form a pleated filter sheet in the process of Yamamoto et al because: a) Yamamoto et al discloses that the paper-like sheet can be impregnated with a resinous material, calendered, etc. (col. 5 lines 1-4); b) Norton discloses forming a corrugated (pleated) paper filter by calendering a fibrous sheet using a pair of profiled calender rolls (figures 1-2); and c) it is well within the purview of choice in the art to choose from known methods based on their suitability for their intended purpose or use, none but the expected result of effectively forming a pleated filter would have been achieved.

As for the limitation that there is no *"inhomogeneities over the cross section of the non-woven fabric"*, Yamamoto et al discloses uniformly dispersing the blend of fibers and accordingly, the resultant sheet exhibit satisfactory properties such as: volume fraction, coefficient of air flow resistance, tensile strength, etc. (col. 6 lines 43-49; col. 10 lines 62-68). These teachings would logically suggest to one in the art that there is no inhomogeneities over the cross-section of the nonwoven fabric. As for the limitation that the fibers are *"bonded in a tension-free manner between profiled calender rolls"*, since neither Yamamoto et al nor Norton expressly teaches exerting any tension to the fibrous sheet during the calendering/bonding operation (see, for intance the process taught by Norton in figures 1-2; the fibrous web is not being pulled or

stretched during the calendering operation or after the web has passed though the calender rolls); and, as noted earlier, Yamamoto et al teaches the fibers are *"fuse-bonded"* together and also teaches heat-calendering the paper-sheet (thus would have suggested to one in the art that, fiber-bonding at least occurs during the calendering step); this limitation would naturally flow from the teachings of Yamamoto et al. As for the limitation of avoiding *"flat bonding"*, such would also directly flow from the process of taught by Yamamoto et al, because (as noted above) the process taught by Yamamoto et al (using profiled rolls) bonds the fibrous web in a tension-free manner between profiled calender rolls without inhomogeneties over the cross-section of the non-woven fabric; and because according to Applicant's disclosure on page 2 paragraph 2: *"To avoid essentially flat bonding, the fibrous web is bonded in a tension-free manner between profiled calender rolls without inhomogeneties over the cross-section of the non-woven fabric."*. In any event, such would have been obvious in the art because Norton also teaches not adversely affecting the porosity or filtering capacity of the paper (col. 1 lines 27-31). This teaching would have suggested to one in the art to avoid any pressed areas or flat spots (i.e. *"flat bonding"*) so that porosity or filtering capacity of the paper is not adversely affected.

In summary, though not explicitly disclosed by the above references, since the method recited in this claim is indistinguishable to the method taught by the art of record (i.e. appears to be identical), it is reasonably expected that the fibrous sheet, of Yamamoto et al using a pair of profiled calender rolls, is bonded in a tension-free manner, without inhomogeneities over the cross-section of the cross-section of the fibrous web and without the use of flat bonding.

With respect to claims 2-4, Yamamoto et al discloses fuse-bonding the undrawn fibers at a low temperature range (col. 3 lines 9-21). This teaching would have reasonably suggested to one in the art to heat the paper-like sheet at a temperature sufficient to soften/melt the undrawn fibers in order to activate the undrawn fibers so that they can effectively function as binding fibers. In order words, during a calendering operation (whether heated or cooled calender rollers are used), one in the art would have ensured that, the paper-like sheet is suffiently hot so that the undrawn fibers are soften/melted to effectively bond the fibers in the paper-like sheet. Therefore, it would have been obvious in the art to perform any one of the three alternative calendering methods recited in these claims in forming the corrugated (pleated) paper filter of Yamamoto et al because only the expected result of sufficiently softening/melting the undrawn fibers activate the them and effectively bond the fibers in the paper sheet would have been achieved in performing either one of the three alternative methods; and because one in the art would have chosen one from among limited effective known methods of calendering the fibrous web to form corrugate the paper filter of Yamamoto et al using a pair of profiled calender rollers.

(11) Response to Argument

Appellant argues that the Yamamoto et al referece teaches away from using a profiled calender to form a corrugated filter because this process would result in crimp formation of fibers, which according to the reference would be undesirable because it would result in an inferior filter. Contrary to Applicant's assertion, Yamamoto et al does not teach away from calendering using a

pair of profile calender rolls. The teachings of Yamamoto et al would have reasonably suggested to one in the art that the undesirable effect of fiber crimping ONLY occur prior to the formation of sheet and NOT during the sheet formation or any subsequent treatment of the sheet as evidence from the following passages: *"... no crimps are effective for producing the paper-like sheet having a small, uniform thickness and an excellent tear strength"* (emphasis added; col. 2 lines 60-63); *"The undrawn filaments were drawn ... without applying a mechanical crimping proceduce to the filaments."* (emphasis added; col. 6 lines 4-8); *"... the tow was subjected to a mechanical crimping ... on the individual filaments"* (col. 7 lines 20-23); and *"The paper-like sheet ... may be ...calendered, embossed or creped."* (Emphasis added; col. 5 lines 1-4). If any fiber crimping is not desired after the sheet is formed and if profiled calendering of a fibrous sheet is taken to form fiber crimping, then Yamamoto et al would teach away from embossing or forming crepe to the sheet because some fiber crimping will also occur. It is also worthnoting that, Yamamoto et al also discloses allowing small number of crimps on the fibers as evidence from the following passage: *"However, the drawn polyester staple fibers may have a small number of crimps naturally created on the fibers during the fiber-producing procedure."* (emphasis added).

In response to Appellant's argument on page 3 last paragraph to page 4 line 4 that the calendering, embossing or creping process step are directed to forming *"... a pattern sheet, a leather-like sheet, ..."* and *"... when discussing the specific process of making a sheet filter, Yamamoto teaches away from the calendering process with profiled rolls."*, as noted earlier, it is

submitted that the teachings of Yamamoto et al would have reasonably suggested to one in the art that the undesirable effect of fiber crimping ONLY occur prior to the formation of sheet and NOT during the sheet formation or any subsequent treatment of the sheet. If Appellant's argument hold true, then is it Appellant's contention that articles, such as carpet backing sheet, wall paper sheet, etc. (col. 5 lines 4-8), of inferior tensile strength would be acceptable, because: Yamamoto et al teaches that crimping of fibers result in an inferior tensile strength (col. 7 statement below table 2) and Yamamoto et al teaches embossing or creping the sheet to form these articles? Equally important, Yamamoto et al clearly discloses that small number of crimping on fibers is acceptable (col. 2 lines 56-59).

In response to Appellant's arguments on page 4 paragraph 1 regarding the following limitation: *"... bonded in a tension-free manner, without inhomogeneities over the cross-section of the cross-section of the fibrous web and without the use of flat bonding ..."*, this limitation would naturally flow from the teachings Yamamoto et al using profiled rolls for reasons set forth above.

In response to Appellant's argument on page 4 in the middle of paragraph 1 regarding the modified profiled calender rolls of Norton not being applicable to Yamamoto et al, it is submitted that Applicant has only presented conclusory statements, but failed to provided factual basis for Appellant's conclusion. As noted above, Yamamoto et al discloses fuse-bonding the fibers together and teaches heat-calendering the fibrous sheet, but is silent as to whether the calender rolls are profiled or not. Since Norton teaches calendering a fibrous sheet using a pair of profiled

rolls to form a pleated filter and since it is advantageous to use a pleated filter over an unpleated filter for reasons given above, it would have been obvious in the art to calender the fibrous sheet of Yamamoto et al using a pair of profiled rolls. Note: Norton also teaches that it is known in the art to calender a fibrous sheet to form corrugated filter using a pair of profiled rolls without providing a solvent treatment on the rolls (col. 1 lines 38-46). With regard to the requirement of bonding during calendering process, it is reasonably understood that bonding is present during the profiled calendering operation in the process of Yamamoto et al because Yamamoto et al teaches heat-calendering the fibrous sheet and fuse-bonding the undrawn fibers. One in the art would have recognized and appreciated that the purpose of heat-calendering the fibrous sheet is to activate the undrawn fibers so that the fibers can be *"fuse-bonded"* together.

In response to Appellant's argument regarding claims 2-3 regarding the *"... preheating of the fibrous web and passing the web between heated or cooled calender rolls"*, it is submitted that obviousness in the sense of § 103 can be based on common sense and logic without any specific suggestion in the prior art relied upon. In re Bozek, 416 F.2d 1385, 163 USPQ 545, 549 (CCPA 1969). See also In re Sovish, 769 F. 2d 738, 226 USPQ 771, 774 (Fed. Cir. 1985). In this case, one in the art would have readily recognized and appreciated that in order to activate (i.e. soften/melt to make them tacky) the undrawn fibers, the web must be heated. It is well within the purview of choice in the art from known effective methods based on their suitability for their intended purpose or use. None but only the expected result of sufficiently softening/melting the

undrawn fibers activate the them and effectively bond the fibers in the paper sheet would have been achieved in performing either one of the three alternative methods.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

scy
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SAM CHUAN YAO
PRIMARY EXAMINER

Michael E. Stimson
Kenyon & Kenyon
One Broadway
New York, Ny 10004
Tel: (212) 425-7200